ABSTRACT OF THE DISCLOSURE

A real-time FROG system provides ultra fast pulse measurement and characterization. The system includes direct, integrated feedback that measures how well the system is retrieving pulses and tracking changes in the pulse train. This feedback is provided in real time and may be in the form of the FROG trace error, the display of the measured and retrieved FROG trace, accuracy of background subtraction or other quality measurement. The system includes preprocessing options that can be used to adjust the dynamic range of the measured signal or to perform different types of filtering. The preprocessing of the FROG trace precedes phase retrieval processing and improves the quality of pulse retrieval.